

**AMENDMENTS TO THE CLAIMS**

The following listing of claims should be entered to replace all prior listings of claims in the application. In accordance with Rule 121, the status of each claim is indicated parenthetically. As can be seen, in this listing, claims 1, 5, 9, 23 and 24 have been amended, claims 2, 6-8, 17-22, 25, 26 and 29-33 have been canceled and claims 70-105 have been added. Claims 34-69 have not been entered by the examiner. The amendments filed in the response on January 5, 2004 should not be entered. Accordingly, the claims as amended include markings to show all changes relative to the prior version of the claims, not including the amendments filed on January 5, 2004. Fees in the amount of \$198.00 were paid in the response filed on January 5, 2004 for the additional claims.

**LISTING OF CLAIMS:**

1. (Currently amended) A process for decomposing waste plastic comprising the steps of:
  - a. supplying waste plastic;
  - b. mixing said waste plastic with a diluent to create a solution;
  - c. ~~controlling a relative free radical content of said solution;~~
  - c. controlling a free radical precursor of said solution;
  - d. heating said solution to a reactant temperature to substantially depolymerize the waste plastic;
  - e. maintaining control of said ~~relative free radical content~~ precursor of said solution during said depolymerization process; and
  - f. collecting the by products of said depolymerization ~~process;~~ process,  
wherein said step of controlling said free radical precursor of said solution comprises the step of adding a substance chosen from a group consisting of waste plastic material, polyvinyl chloride and polyurethane.
2. (Canceled)

3. (Original) A process for decomposing waste plastic as described in claim 1 wherein said step of heating said solution to a reactant temperature to substantially depolymerize the waste plastic comprises the step of heating to less than about 400°C.
4. (Original) A process for decomposing waste plastic as described in claim 1 wherein said step of heating said solution to a reactant temperature to substantially depolymerize the waste plastic comprises the step of heating to about 375°C.
5. (Currently amended) A process for decomposing waste plastic as described in claim 1, wherein said step of controlling a ~~relative~~ free radical content precursor of said solution comprises the step of adding a third substance to said process respective of said waste plastic ~~and said oil~~.
- 6-8. (Canceled)
9. (Currently amended) A process for decomposing waste plastic as described in claim 1 wherein said step of controlling a ~~relative~~ free radical content precursor of said solution comprises the step of sensing the relative amount of free radicals likely to be present in said solution after it is heated.
10. (Previously presented) A process for decomposing waste plastic as described in claim 9 wherein said step of sensing the relative amount of free radicals likely to be present in said solution after it is heated comprises the step of ascertaining the reactant temperature of said solution.
11. (Original) A process for decomposing waste plastic as described in claim 1 and further comprising the step of recycling a portion of said diluent.

12. (Original) A process for decomposing waste plastic as described in claim 1 and further comprising the step of recycling from 0 to 95% of said diluent.
13. (Original) A process for decomposing waste plastic as described in claim 11 wherein said step of recycling a proportion of said diluent comprises the step of recycling from 70% to 90% of said diluent.
14. (Original) A process for decomposing waste plastic as described in claim 1 wherein said step of mixing said waste plastic with a diluent to create a solution comprises the step of mixing said waste plastic with an oil.
15. (Original) A process for decomposing waste plastic as described in claim 1 wherein said step of mixing said waste plastic with a diluent to create a solution comprises the step of mixing said waste plastic with a heavy oil.
16. (Original) A process for decomposing waste plastic as described in claim 1 wherein said step of mixing said waste plastic with a diluent to create a solution comprises the step of mixing said waste plastic with a low value oil.
- 17-22. (Canceled)
23. (Currently amended) A process for decomposing waste plastic as described in claim 1, wherein said step of controlling a ~~relative free radical content~~ precursor of said solution comprises controlling the free radical content of said solution.
24. (Currently amended) A process for decomposing waste plastic as described in claim 1, wherein said step of controlling a ~~relative free radical content~~ precursor of said solution comprises controlling the free radical content to substantially depolymerize said waste plastic.
- 25-26. (Canceled)

27. (Previously presented) A process for the recycling of waste plastic as described in claim 1 wherein said solution comprises a separate catalyst precursor.
28. (Previously presented) A process for the recycling of waste plastic as described in claim 1 wherein said waste plastic includes polyvinyl chloride and no separate free radical catalyst precursor is added to said solution.
- 29-33. (Canceled)
- 34-69. (Not entered)
70. (New) A process for decomposing waste plastic comprising the steps of:
- supplying waste plastic;
  - mixing said waste plastic with a diluent to create a solution;
  - controlling a relative free radical content of said solution;
  - heating said solution to a reactant temperature to substantially depolymerize the waste plastic;
  - maintaining control of said relative free radical content of said solution during said depolymerization process; and
  - collecting the by products of said depolymerization process,
- wherein said solution comprises a separate catalyst precursor.
71. (New) A process for decomposing waste plastic as described in claim 70 wherein said step of heating said solution to a reactant temperature to substantially depolymerize the waste plastic comprises the step of heating to less than about 400°C.
72. (New) A process for decomposing waste plastic as described in claim 70 wherein said step of heating said solution to a reactant temperature to substantially depolymerize the waste plastic comprises the step of heating to about 375°C.

73. (New) A process for decomposing waste plastic as described in claim 70 wherein said step of controlling a relative free radical content of said solution comprises the step of adding a third substance to said process respective of said waste plastic.
74. (New) A process for decomposing waste plastic as described in claim 70 wherein said step of controlling a relative free radical content of said solution comprises the step of controlling free radical precursor of said solution.
75. (New) A process for decomposing waste plastic as described in claim 74 wherein said step of controlling free radical precursor of said solution comprises the step of adding a waste plastic material to said process.
76. (New) A process for decomposing waste plastic as described in claim 74 wherein said step of controlling free radical precursor of said solution comprises the step of adding a substance chosen from a group consisting of polyvinyl chloride and polyurethane.
77. (New) A process for decomposing waste plastic as described in claim 70 wherein said step of controlling a relative free radical content of said solution comprises the step of sensing the relative amount of free radicals likely to be present in said solution after it is heated.
78. (New) A process for decomposing waste plastic as described in claim 77 wherein said step of sensing the relative amount of free radicals likely to be present in said solution after it is heated comprises the step of ascertaining the reactant temperature of said solution.
79. (New) A process for decomposing waste plastic as described in claim 70 and further comprising the step of recycling a portion of said diluent.
80. (New) A process for decomposing waste plastic as described in claim 70 and further comprising the step of recycling from 0 to 95% of said diluent.

81. (New) A process for decomposing waste plastic as described in claim 79 wherein said step of recycling a proportion of said diluent comprises the step of recycling from 70% to 90% of said diluent.
82. (New) A process for decomposing waste plastic as described in claim 70 wherein said step of mixing said waste plastic with a diluent to create a solution comprises the step of mixing said waste plastic with an oil.
83. (New) A process for decomposing waste plastic as described in claim 70 wherein said step of mixing said waste plastic with a diluent to create a solution comprises the step of mixing said waste plastic with a heavy oil.
84. (New) A process for decomposing waste plastic as described in claim 70 wherein said step of mixing said waste plastic with a diluent to create a solution comprises the step of mixing said waste plastic with a low value oil.
85. (New) A process for decomposing waste plastic as described in claim 70 wherein said step of controlling a relative free radical content of said solution comprises controlling the free radical content of said solution.
86. (New) A process for decomposing waste plastic as described in claim 70 wherein said step of controlling a relative free radical content of said solution comprises controlling the free radical content to substantially depolymerize said waste plastic.
87. (New) A process for the recycling of waste plastic as described in claim 70 wherein said waste plastic includes polyvinyl chloride and no separate free radical catalyst precursor is added to said solution.
88. (New) A process for decomposing waste plastic comprising the steps of:
- a. supplying waste plastic;

- b. mixing said waste plastic with a diluent to create a solution;
  - c. controlling a relative free radical content of said solution;
  - d. heating said solution to a reactant temperature to substantially depolymerize the waste plastic;
  - e. maintaining control of said relative free radical content of said solution during said depolymerization process; and
  - f. collecting the by products of said depolymerization process,
- wherein said waste plastic includes polyvinyl chloride and no separate free radical catalyst precursor is added to said solution.
89. (New) A process for decomposing waste plastic as described in claim 88 wherein said step of heating said solution to a reactant temperature to substantially depolymerize the waste plastic comprises the step of heating to less than about 400°C.
90. (New) A process for decomposing waste plastic as described in claim 88 wherein said step of heating said solution to a reactant temperature to substantially depolymerize the waste plastic comprises the step of heating to about 375°C.
91. (New) A process for decomposing waste plastic as described in claim 88 wherein said step of controlling a relative free radical content of said solution comprises the step of adding a third substance to said process respective of said waste plastic.
92. (New) A process for decomposing waste plastic as described in claim 88 wherein said step of controlling a relative free radical content of said solution comprises the step of controlling free radical precursor of said solution.
93. (New) A process for decomposing waste plastic as described in claim 92 wherein said step of controlling free radical precursor of said solution comprises the step of adding a waste plastic material to said process.

94. (New) A process for decomposing waste plastic as described in claim 92 wherein said step of controlling free radical precursor of said solution comprises the step of adding a substance chosen from a group consisting of polyvinyl chloride and polyurethane.
95. (New) A process for decomposing waste plastic as described in claim 88 wherein said step of controlling a relative free radical content of said solution comprises the step of sensing the relative amount of free radicals likely to be present in said solution after it is heated.
96. (New) A process for decomposing waste plastic as described in claim 95 wherein said step of sensing the relative amount of free radicals likely to be present in said solution after it is heated comprises the step of ascertaining the reactant temperature of said solution.
97. (New) A process for decomposing waste plastic as described in claim 88 and further comprising the step of recycling a portion of said diluent.
98. (New) A process for decomposing waste plastic as described in claim 88 and further comprising the step of recycling from 0 to 95% of said diluent.
99. (New) A process for decomposing waste plastic as described in claim 97 wherein said step of recycling a proportion of said diluent comprises the step of recycling from 70% to 90% of said diluent.
100. (New) A process for decomposing waste plastic as described in claim 88 wherein said step of mixing said waste plastic with a diluent to create a solution comprises the step of mixing said waste plastic with an oil.
101. (New) A process for decomposing waste plastic as described in claim 88 wherein said step of mixing said waste plastic with a diluent to create a solution comprises the step of mixing said waste plastic with a heavy oil.



102. (New) A process for decomposing waste plastic as described in claim 88 wherein said step of mixing said waste plastic with a diluent to create a solution comprises the step of mixing said waste plastic with a low value oil.
103. (New) A process for decomposing waste plastic as described in claim 88 wherein said step of controlling a relative free radical content of said solution comprises controlling the free radical content of said solution.
104. (New) A process for decomposing waste plastic as described in claim 88 wherein said step of controlling a relative free radical content of said solution comprises controlling the free radical content to substantially depolymerize said waste plastic.
105. (New) A process for the recycling of waste plastic as described in claim 88 wherein said solution comprises a separate catalyst precursor.